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ABSTRACT

The purpose of this study was to compare the knowledge and attitude test results of a student-led discussion group in two college-level introductory health courses. The 70 students enrolled in the courses were divided into eight groups represented as equally as possible concerning sex, age, year, and major in school. Student discussion leaders were chosen by democratic and volunteer methods. Students were pre- and posttested with the Kilander Health Knowledge test and the Meise Scale for Measurement of Attitudes toward Healthful Living. Based on results of the analysis and interpretation of the data, the conclusions were the following: (a) student-led discussion groups appeared to be at least as effective in transferring knowledge as teacher-led discussion groups; (b) student-led discussion groups seemed to be as effective in developing positive attitudes towards healthful living as teacher-led discussion groups; (c) a variety of teaching methods should be used in teaching, since many students in both teacher-led and student-led discussion groups did not respond appropriately in knowledge gain or attitude change; and (d) direct contact with the teacher is not always mandatory for desired learning to take place, since the student-led groups were without the teacher approximately one-third of the class time but resulted in similar gains in knowledge and changes in attitudes as the teacher-led groups. (PB)

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A COMPARISON OF STUDENT-LED DISCUSSION GROUPS TO TEACHER-LED DISCUSSION GROUPS OF TEACHING COLLEGE INTRODUCTORY HEALTH COURSES

by

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ABSTRACT

Statement of the Problem

The general problem was to compare the knowledge and attitude test results of a student-led discussion group with the knowledge and attitude test results of a teacher-led discussion group in two college level Introductory Health courses.

An analysis of the general problem resulted in the following more specific problems:

1. to select appropriate evaluating instruments to be applied in measuring the knowledge and attitudes of the subjects;
2. to identify and organize procedures for teaching in the groups;
3. to identify and acquire an appropriate population.

Procedures

The 70 college students comprising the total population of two assigned Introductory Health classes at Central Michigan University were pre-tested with the Kilander Health Knowledge test and A Scale for Measurement of Attitudes Toward Healthful Living by Meise. Students were divided into eight groups so that the groups would be as equally represented as possible concerning the subjects' sex, age, year and major in school.

Student discussion leaders were chosen by democratic and volunteer methods and randomly assigned to lead groups in

discussion. Procedure Sheets were developed by the teacher. Each week all group leaders would meet to receive instruction and demonstration by the teacher of the plan on the Procedure Sheets. Guidelines on the Procedure Sheets were used to personally lead two discussion groups while students used the same guidelines to lead other discussion groups.

All students were also post-tested with the Kilander Health Knowledge test and A Scale for Measurement of Attitudes Toward Healthful Living by Meise. The t-test and one-way analysis of variance was used to compare the pre-test and post-test differences of student-led discussion groups with teacher-led discussion groups.

Findings

The hypothesis was stated in the null form. The analysis of data by the t-test and the one-way analysis of variance supported the null hypothesis in that there was no sifnificant differences found in health knowledge and attitude test results when the student-led discussion groups were compared with teacher-led discussion groups. Therefore, the hypothesis stated in null form was accepted.

Conclusions

Based upon the results of the analysis and interpretation of the data, and remaining within the limitations of the design of the study, the conclusions were:

1. Student-led discussion groups appeared to be at least

as effective in transferring knowledge as the teacher-led discussion groups.

2. Student-led discussion groups seemed to be as effective in developing positive attitudes towards healthful living as the teacher-led discussion groups.

3. A variety of teaching methods should be used in teaching, since many students in both the teacher-led and student-led discussion groups did not respond appropriately in knowledge gain or attitude change.

4. Direct contact with the teacher is not always mandatory for desired learning to take place, since the student-led groups were without the teacher approximately one-third of the class time but resulted in similar gains in knowledge and changes in attitudes as the teacher-led groups.

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INTRODUCTION

Types of teaching methods in education are very crucial when considering meaningful and relevant instruction. Teachers should continually examine more effective ways of facilitating student learning. Bloom (1953) found that college students' thoughts were more often relevant to the subject matter in discussion than in teacher-centered sessions because of the greater functioning of group cohesiveness, norms, interpersonal perceptions, and similar forces in discussion.

Anderson (1959) challenged Bloom's conclusions by: doubting the definitions of teacher-centered and student-centered classes as being much different; questioning the effectiveness of discussion and teacher-centered methods in certain subject matter areas; and debating the true process that evolves in the learning sessions rather than simply labeling the process. Stern (1963) and McKeachie (1963, 1967) all have agreed that no consistent differences occur in knowledge outcomes, but the student-centered class yields greater gains in higher cognitive processes and in affective outcomes.

Gage (1969) stressed a point when he stated the following:

> The lack of difference between teacher- and student-centered discussions in the degree to which students acquire knowledge may be attributable to the availability of many sources of knowledges, such as reading and independent study, other than those provided by the teacher's verbal behavior in the classroom.

> The supperiority of student-centered discussions in promoting higher level cognitive skills, such as the ability to think critically or make applications, probably stems from the greater opportunity to practice such skills in student-centered discussions, where students have freedom to try alternatives, covertly or overtly, and receive feedback from the group concerning their validity (Gage, 1969, p. 1458).

Statement of the Problem

The general problem was to compare the knowledge and attitude test results of a student-led discussion group with the knowledge and attitude test results of a teacher-led discussion group in two college level Introductory Health courses.

An analysis of the general problem resulted in the following more specific problems:

1. to select appropriate evaluating instruments to be applied in measuring the knowledge and attitudes of the subject;
2. to identify and organize procedures for teaching the groups;
3. to identify and acquire an appropriate population.

Delimitations

The study was delimited to the students in the Introductory Health courses at Central Michigan University during the Fall semester of 1971. It was also delimited to the two instruments selected to measure knowledge and attitudes.

Limitations

The study may have been limited by:

1. the sex, age, year and major in school of the subjects;
2. the reliability of the subjects' answers on the tests;
3. the previous experiences held by the teacher and the students concerning group discussion techniques.

Hypothesis

Because of findings in the related literature and past personal experience, the following hypothesis in the null form was proposed. There will be no significant differences in health knowledge and attitude test results between the student-led group and the teacher-led group.

Definitions

In order to facilitate understanding, the following terms were defined:

1. Teacher-led discussion group.--The teacher directed the discussion as planned on the procedure sheet with primary emphasis placed upon students participating in the group discussion.

2. Student-led discussion group.--A student, selected by the class, directed the discussion as planned on the procedure sheet, with primary emphasis placed upon students participating in the group discussion. This particular method has also been termed learner-centered, self-directed, independent study, discussion, non-directive, democratic, pupil planned and integrative in the literature.

3. Procedure Sheet.--The procedure sheet was an outline of concepts, questions, actions and information in each specific subject to be followed in the discussion group. The discussion leader's duty was to follow this outline.

4. Micro project.--A learning activity in which the students were personally involved in the investigation of a health related

problem within the community. The investigation was then recorded with the following information: introduction; statement of problem; procedure; analysis of data; conclusions and recommendations.

5. Introductory Health course.--A survey course, usually designed for freshmen, which introduced the student to a wide range of related topics in individual and group health. The course was designed to assist students to live more healthy lives through scientific knowledge, favorable attitudes and desirable health habits.

6. Kilander Health Knowledge Test.--A test of 100 multiple choice questions that was designed by H. F. Kilander and G. C. Leach to measure the extent of a college student's knowledge and understanding of matters pertaining to health areas.

7. A Scale for the Measurement of Attitudes Toward Healthful Living.--A self-report instrument of 100 statements designed by W.C. Meise to provide a quantified evaluation of students' attitudes toward health at a particular time of life, since attitudes are changeable and affected by time.

Design

The research design was a descriptive study using the four celled study model as defined by McGrath (1970). Only the results of the groups studied were described. However, inferences perhaps could be made to the population of students taking the Introductory Health courses in all sections at Central Michigan University and similar populations elsewhere to the extent that this study was representative of those populations.

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Internal validity.--Internal validity was critical. The extent to which the teaching techniques and the measuring instruments were controlled and used was crucial. Explaining the testing instructions well and the importance of honest answers on the tests were important. Sex, age, year and major in school were recorded on each individual to indicate the degree of homogeneity of these variables. They were them controlled by matched group assignments at the beginning of the semester. To insure consistency in testing and instruction, the same instructor was used throughout the study.

External validity.--External validity was not deemed critical as the population consisted of groups at hand rather than randomized representative samples. No attempt was made to generalize beyond the groups investigated.

Justification

An important problem relating to any learning situation is the effectiveness of the methods or techniques used. In many ways, this effectiveness has not been considered in the past. Read and Greene (1971) have pointed this out by stating:

> It is not enough to consider the student as a human vacuum into which a teacher can pour all the accumulated wisdom of good health. For one, the practice of merely teaching unrelated facts of doubtful relevance is receiving severe criticism today. Essential background must not be omitted, of course, but its purpose should be considered carefully so that the information is meaningful to the student.
>
> A second consideration must be given to the students themselves. Mere translation of knowledge by an adult does not necessarily make him an adequate teacher in the eyes of his pupils (Read and Greene, 1971, p.3).

Couch (1972) spoke of the need for investigating the methods of teaching Introductory Health courses at the college level, since this course has become irrelevant and dry in many areas of the nation. Her group of investigators at Wayne State was attempting to assess the quality of teaching being done in the Introductory Health courses throughout the nation. The findings of this study were not available since the procedures have not been completed.

A purpose of this study was to provide knowledge regarding the effectiveness of students leading discussion groups containing their peers. The information could be used when considering teaching methods in health courses. This method of instruction needs to be researched to determine how it affects students and to what extent it compares with other practices. It is hoped that the results of this study will lead to a more realistic consideration of the health educational needs of students based upon their performance in Introductory Health courses.

PROCEDURES

The procedures are presented in five sections. Section one explains the selection of appropriate evaluating instruments; section two includes the method of sampling the subjects and assigning of subjects to groups; section three gives the process by which student leaders were prepared to lead discussion groups; section four presents the method by which the data were collected; and section five reveals the treatment of data obtained from the evaluating instruments.

I. Selection of Instruments

A number of instruments were obtained and reviewed to determine which would be most suitable for the task at hand. Many of the instruments were old and were not sensitive to current subject matter. Many did not pertain to the total range of health related topics but only specific topics. Others could be used only for high school students.

The Kilander Health Knowledge test was chosen because it was designed for college students and had been tested for over 33 years involving over 100,000 individual scores. The test consisted of questions which utilized subject matter discussed in every topic in the Introductory Health courses. An up-to-date 1969 revision was chosen because of its current topics and relevant

questions. Test scoring was computerized and administration of the test took 50 minutes which was the same as the time alloted for the classes used in the study. The reliability coefficient was .80 plus or minus .007 determined by comparing odd and even questions and applying the Spearman-Brown formula. Validity was determined empirically from state courses of study and textbooks on health.

It was extremely difficult to identify an appropriate attitude scale. A Scale for Measurement of Attitudes Toward Healthful Living by Meise was chosen for the following reasons: (1) it was especially worded for college freshmen and sophomores; (2) it included every topic that was discussed in the Introductory Health course; and (3) the test could be administered in 50 minutes and scored either by hand or computer. The reliability was determined by comparing odd and even statements and was found to be .74 for the half test. When the Spearman-Brown formula was applied for the full test, this coefficient was raised to .85. In the item analysis, the Kuder-Richardson formula 20 was applied which resulted in a reliability coefficient of .93. The instrument has a built in lie scale and paired statements for validity.

II. Sampling Procedures

In August of 1971 students at Central Michigan University registered for Fall semester classes. In addition, students registering for Health Education 106 had the option of selecting

any Health Education 106 section that they felt appropriate from the 32 sections offered. In scheduling classes for available teachers, Frank Myers (Chairman of the Department of Health Education at Central Michigan University) assigned two of these sections (9033 and 9034) to be taught by the investigator of this study. Reason for the assignment of sections 9033 and 9034 was because of the time blocks available for the teacher of those courses. Section 9033 consisted of 33 students and section 9034 consisted of 37 students all of which were used as the population for this study.

Students were assigned to eight groups so that consistency within the eight groups would be equated concerning students' age, sex, year and major in school. Therefore, the groups were as similar as possible in regard to the above four criteria.

On the first day of class, volunteer discussion leaders for the small group discussions were solicited from among the class members. To motivate volunteers, students were told that an A grade would be awarded to all discussion leaders for their time and effort given to the course. All persons who volunteered were given until the next class meeting to organize a one minute statement as to why they wanted to be discussion leaders. At the second class meeting, those that had volunteered told the class why they thought they should be discussion leaders. The class then voted and the students who received the most votes were randomly assigned to lead discussion groups. Also the teacher personally led two discussion groups.

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III. Preparation of Student Discussion Leaders

Student discussion leaders were prepared in the three following ways: a training period at the beginning of the semester; Procedure Sheets given them weekly; and weekly meetings in which instruction and demonstration of the procedures to be used were given by the teacher.

The six hour training period at the beginning of the semester was used to orient students to a general background needed to lead discussion groups. Time was spent examining and discussing in detail information contained on the "Group Leadership" and "Hints for Guiding Groups" sheets which can be found in Appendix A. Students also participated in a mock group discussion.

The teacher developed Procedure Sheets which contained guidelines for leading group discussion in all the topics of the Introductory Health course. A sheet contained concepts, procedures in outline form and discussion questions for each discussion topic. All group discussion leaders were to follow the Procedure Sheet in all group discussions.

Weekly meetings were held in which the Procedure Sheet for the appropriate topic was given to and discussed with all leaders. A mock discussion group was held. The teacher would take the role of the discussion leader with the student discussion leaders assuming the role of group members. Stude ts were to use the mock discussion group as a pattern to guide their discussion groups.

IV. Method of Data Collection

The Kilander Health Knowledge test and the Meise Scale for Measurement of Attitudes Toward Healthful Living were administered to all subjects during the first week of school. The students were told that this project was a part of the general evaluation program of the University. They were also told that the test results would have no influence on their grades, but the results would be compared to numerous other students who had also taken the tests. Along with the above information, the instructions were followed as stated in the Instructor's Manuals to the tests.

The post-tests were administered the last week of the semester as part of the final examinations. The same instructions were followed in the post-test as in the pre-test.

V. Treatment of the Data

Following the collection of data, the scores on all tests and scales were recorded. The t-test and the one-way analysis of variance were used to treat the data. Both statistical techniques were used to negate any doubt that one technique may have had stronger efficiency than the other technique and to analyze the groups by the following two different procedures: by pooling all teacher-led group means and comparing them with the pooling of all student-led group means; and by comparing each group as a separate mean.

The average mean group differences between the pre- and post-tests of all the student-led subjects were compared with

the average mean group differences of all the teacher-led subjects by the t-test. This procedure was used to examine the possible significant difference between the group being led by the teacher as compared to the group being led by students.

The analysis of variance was used to determine if there was any significant differences between any of the eight groups after the experimental variable was applied. The computer was programmed to treat unequal numbers of subjects in each group since numbers in the groups were crucial to use of the analysis of variance. The S-Method of multiple comparison was then applied to any data that were declared significant by the analysis of variance so that the source of existing significant differences might be found.

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ANALYSIS OF DATA

The purpose of this research project was to compare the knowledge test results and the attitude scale results from a student-led discussion group with the knowledge test results and attitudes scale results from a teacher-led discussion group in two Introductory Health courses. Data were collected by use of the Kilander Health Knowledge Test and A Scale for the Measurement of Attitudes Toward Healthful Living by Meise. The test and scale were administered in a pre- and post-test manner to 70 subjects at Central Michigan University during the Fall of 1971.

During the experimental phase, between the pre-test and the post-test, the two classes were divided into eight groups of eight to ten students each. Two of the groups were led by the teacher and six of the groups were led by students selected from their respective classes. The feasibility of the teacher leading more than two groups was not appropriate because of time, economics and the number of teachers available. All group leaders had a procedure sheet to follow at each discussion group meeting. Group discussion was used more than one-third of the total class time.

Data were tabulated on the differences between the pre-test scores and the post test scores. The group mean differences were compared by the t-test and the one-way analysis of variance.

The analysis was done for both procedures on the IBM 1130 computer system. In the case of the analysis of variance, a special program was sued which treated data involving an unequal number of subjects in each group. Data are presented in two categories: (a) analysis of Kilander Knowledge Test, and (b) analysis of Meise attitude scale.

I. Kilander Knowledge Test

Summarized in Table 1 are the results of the combined teacher-led groups compared with the combined student-led groups by using the t-test. Only the differences between the pre- and post-tests were considered.

TABLE 1

COMBINED TEACHER-LED GROUPS COMPARED WITH STUDENT-LED GROUPS USING t-TEST (Kilander Knowledge Test)

Groups	Number of Subjects	Mean Difference	Standard Deviation	t
Teacher-led	17	8.24	8.48	0.663* (df=68) N.S.
Student-led	53	6.81	7.28	

*t must exceed 1.960 to be significant at .05 level.

The number of subjects differed greatly because there were only two groups pooled in the teacher-led but six groups pooled in the student-led. A complete summary of raw data may be found in Appendix B. The number of subjects in each group was taken into account when the means were compared.

Since the calculated t was 0.663, which is smaller than 1.960, it was concluded that there was no significant difference between the teacher-led group when compared to the student-led group concerning health knowledge change. The two-tailed test was used because of the possibility that negative results could have occurred.

The above results were not surprising as shown by the results in Table 2. Raw data means and standard deviations for all eight groups on both the pre-test and post-test are shown. A characteristic of the pre- and post-test results shown in Table 2 was the closeness of the means and seemingly normal standard deviations. The scores were in relationship to a perfect score being 100. On the pre-test, group four ranks the lowest with a mean of 56.75; however, all the other means seem to be very close with scores ranging between 61 to 65.

TABLE 2

RAW SCORE GROUP MEANS AND STANDARD DEVIATIONS
(Kilander Knowledge Test)

Group	Pre-test		Post-test	
	Mean	S.D.	Mean	S.D.
1	60.66	11.77	73.33	5.92
2	61.37	11.96	66.75	12.09
3	63.00	10.23	73.00	11.93
4	56.75	11.74	68.50	11.40
5	65.40	9.76	71.10	6.42
6	62.11	13.06	64.44	11.34
7	63.44	8.08	68.44	9.66
8	64.00	11.14	69.11	14.20

By examining the pre-test means and standard deviations, it can be assumed that the groups were fairly homogeneous in variance. The Bartlett test statistic with seven degrees of freedom was found to be $\chi^2 = 10.715$ which is not significant at the .05 level. Therefore, equal variance was found to exist along with assumed normality and independent distribution of error.

The post-test means were all larger than the pre-test means which signified a gain of knowledge in all groups. Because standard deviations were widely spread, the resultant gain in knowledge was somewhat sporatic.

The pre-test scores were subtracted from the post-test scores so the difference between the two groups could be tested statistically. Table 3 shows the data obtained from the differences between the pre- and post-tests for all groups. Groups one and six were important because they contained means which were quite different.

TABLE 3

GROUP MEANS AND STANDARD DEVIATIONS OF KILANDER PRE-POST TEST DIFFERENCES

Group	Size	Mean Difference	Standard Deviation
1	9	12.66	8.48
2	8	5.38	8.16
3	8	10.00	4.14
4	8	11.75	6.92
5	10	5.80	7.81
6	9	2.33	6.91
7	9	5.00	3.35
8	9	5.11	9.36

Since the size of the groups were not equal, a one-way analysis of variance with unequal numbers of observations in each group was used. The analysis of variance was used as an alternate to the information provided by the t-test in order to verify the t-test. Table 4 illustrates the analysis of variance results.

TABLE 4

ANALYSIS OF VARIANCE TABLE
(Kilander Knowledge Test)

Source	SS	DF	MS	F ratio
Between Means	839.41	7	119.92	2.309*
Within	3219.86	62	51.93	
Total	4059.27	69		

*F must exceed 2.167 to be significant at .05 level.

A comparison of the means resulting from the analysis of variance indicated that the F ratio was equal to 2.309. Since F had to exceed 2.945 to be significant at the .01 level, it was concluded that F was not significant. However, at the .05 level of significance, an F ratio of 2.167 was significant. Since the calculated F was 2.309, it was concluded that there was a difference between the groups assuming this level of confidence was acceptable.

To find which groups differed, the S-Method of multiple comparison by Scheffe was used. The difference between the means of the student-led groups compared to the teacher-led groups was

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calculated to be $\Upsilon = 1.57$. The range of the confidence interval was found to be 29.88 ± 1.57. Since 1.57 is not significantly different from zero, there is no significant difference between teacher-led and student-led groups. The S-Method supports the t-test, however the t-test was more stringent in this situation. The null hypothesis is accepted in that no difference existed statistically between any of the groups, student-led or teacher-led, concerning health knowledge change.

II. Meïse Attitude Scale

Table 5 shows the results of the mean of the combined teacher-groups compared with the mean of the combined student-led groups using the t-test. Here again, the number of subjects differed greatly because there were two groups pooled for the teacher-led but six groups pooled for the student-led. A complete summary of the raw data may be found in Appendix D. The number of subjects in each group was taken into account when the means were compared.

TABLE 5

COMBINED TEACHER-LED GROUPS COMPARED WITH STUDENT-LED GROUPS USING t-TEST (Meise Attitude Scale)

Groups	Number of Subjects	Mean Difference	Standard Deviation	t
Teacher-led	17	8.41	24.46	1.314* (df=68) N.S.
Student-led	53	0.91	18.61	

*t must exceed 1.960 to be significant at .05 level.

For a significant difference to occur at the .05 and .01 levels of significance, the t had to exceed 1.96 for a two-tailed test. Since the calculated t was 1.314, which is smaller than 1.960, it was concluded that there was no difference between the teacher-led group compared to the student-led group concerning health attitude change when using the t-test.

Table 6 shows the results of the means and standard deviations for each of the eight groups. The raw data indicates a closeness in the pre-test with the means varying no more than 15 points. The only exception to this was group two with a mean of 381.38. Since the scores on the Meise attitude scale can vary as much as 600 points, this would indicate a degree of homogeneity. The value of the Bartlett test statistic with seven degrees of freedom was found to be $\chi^2 = 9.897$, which is not significant at the .05 level. Therefore, equal variance was found to exist in all groups.

TABLE 6

RAW SCORE GROUP MEANS AND STANDARD DEVIATIONS
(Meise Attitude Scale)

Group	Pre-test		Post-test	
	Mean	S.D.	Mean	S.D.
1	416.33	16.99	410.11	17.35
2	381.38	32.74	379.38	17.25
3	391.50	18.92	399.63	12.24
4	398.00	13.45	403.75	19.83
5	405.50	17.16	403.60	26.48
6	401.55	32.03	401.78	36.65
7	395.33	22.09	403.33	13.97
8	397.11	41.66	407.89	26.50

The post-test results revealed that groups one, two, and five all had negative scores concerning attitude, which were student-led groups. The means of the other groups did not change a great deal. The standard deviations for all groups did change considerably. In such groups as two, three, seven and eight the standard deviations narrowed considerable. This change may have indicated that the groups became more homogenesis in their health attitudes. Conversely, groups one, four, five and six may have become more dissimilar in their health attitudes. Conversely, groups one, four, five and six may have become more dissimilar in their health attitudes. Only one teacher-led group (Group4) was very comparable to the student-led groups as seen above.

The test for statistical significance was applied to the difference between the pre-test and post-test scores. Table 7 shows the data obtained from this procedure.

TABLE 7

GROUP MEANS AND STANDARD DEVIATIONS OF MEISE PRE-POST TEST DIFFERENCES

Group	Size	Mean Difference	Standard Deviation
1	9	-6.22	12.19
2	8	-2.00	22.83
3	8	8.13	19.55
4	8	5.75	14.15
5	10	-1.90	20.19
6	9	0.22	17.02
7	9	8.00	20.53
8	9	10.77	32.91

Following through from the raw scores it was found that groups one, two, and five (all student-led) had negative scores. Means differed greatly between groups one and eight (-6.22 to 10.78 respectively). The standard deviation of group eight (32.91) was very high which may have caused some of the wide variation in the group eight mean. After looking at the raw data (Appendix B), it was found that most of that variance was probably attributed to one student.

Since the size of the groups were not equal, the one-way analysis of variance with unequal number of observations in each group was used. The analysis of variance was used as an alternate to the data obtained from the t-test for verification of the t-test results. Table 8 illustrates the basis of the analysis of variance.

TABLE 8

ANALYSIS OF VARIANCE TABLE
(Meise Attitude Scale)

Source	SS	DF	MS	F ratio
Between Means	2309.90	7	329.99	0.759* N.S.
Within	26939.94	62	434.52	
Total	26249.84	69		

*F must exceed 1.000 to be significant at .05 level.

A comparison of the means that resulted from the analysis of variance showed that the F ration was equal to 0.759. To be significant at both the .01 and .05 levels of significance, F had to equal more than 1.000. Therefore, the calculated F was

not significant at either level. It was concluded that there was no difference statistically between any of the groups, student-led or teacher-led, concerning health attitude change.

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SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

I. Summary

Within recent years, many teachers have been forced to examine the effectiveness of their teaching methods because accountability for student ability has become a top priority in education. True evaluation of student quality as well as the methods used to obtain that quality has been immensely lacking. Accordingly, it follows that more accurate and precise research of teaching methods should advance the status of education.

The Problem

The problem was to compare the knowledge and attitude test results of student-led discussion groups with the knowledge and attitude test results of teacher-led discussion groups in two Introductory Health courses at Central Michigan University.

Procedures

The procedures were to:

1. Obtain 35 copies of both the Kilander Health Knowledge test and A Scale for Measurement of Attitudes Toward Healthful Living by Meise.
2. Acquire two Introductory Health classes at Central Michigan University to be used for the study.

3. Pre-test all subjects by using the Kilander Health Knowledge test and A Scale for Measurement of Attitudes Toward Healthful Living.
4. Divide the subjects into eight groups so that the groups would be as equally represented as possible concerning sex, age, year and major in school of the subjects.
5. Attain student discussion leaders by volunteer and democratic methods and randomly assign them to lead groups.
6. Develop Procedure Sheets and each week all group leaders meet to receive instruction and demonstration by the teacher of the guidelines on the Procedure Sheet.
7. Have both the teacher and student leaders use the Procedure Sheets to lead discussion groups.
8. Post-test all subjects using the Kilander Health Knowledge test and A Scale for Measurement of Attitudes Toward Healthful Living.
9. Collect, organize and interpret data.

Findings

The hypothesis was stated in the null form. In relation to the hypothesis, the analysis of data by the t-test and the one-way analysis of variance supported the null hypothesis in that there were no significant differences in health knowledge and attitude test results when the student-led discussion group was compared to the teacher-led discussion group. Therefore, the hypothesis stated in null form was accepted

II. Discussion

Although there were no significant differences in knowledge and attitude change when comparing the teacher-led discussion group with the student-led discussion group, there was some evidence of importance that should merit special consideration here. Open-ended student evaluations were collected for each class and specific attention was given to students' perception of the effectiveness of several aspects of the small discussion group sessions.

When comparing students who had little or no experience with discussion group leadership to a professional teacher who had experience with discussion group leadership, it was interesting to note the similarity in results as tested for both knowledge and attitude change. The teacher-led groups were well within the same range of socres as the student-led groups (Tables 2 and 6). The similarity in results tended to give a great deal of credit to the student leaders because of their lack of experience and immaturity. With proper guidance, many times students who are given responsibility may become very good leaders and effective teachers.

When the eight groups were compared concerning attitude change, the teacher-led groups showed the greatest positive attitude increase (Table 7). Three of the six student-led groups showed negative results in attitude change which suggests that their attitudes toward healthful living had perhaps become worse while being in the course. When observing the teacher-led

group mean difference (8.41) compared to the student-led group mean difference (0.91) a notable inequality was revealed (Table5). There may have been enough consistency in looking at these two comparisons to suggest perhaps that attitudes toward healthful living were changed more favorably when a teacher was present. However, there was no statistical significance to support this.

The meaningfulness of the discussion groups were sometimes questioned by the students. Comments made by students varied greatly concerning the relevance of the group activities. Sometimes the group experience was thought to be too somple. Students thought many of the group experiences were "fantastic." Other times students either could not grasp the full meaning or intent of the activity. It may have been that students were trying to assimilate the ideas being discussed but did not have time or take time to digest them fully. Literature (Gage, 1969; Stern, 1963; McKeachie, 1963, 1967) has suggested that over a period of time a higher form of learning than simply factual information may be acquired because of the group experience.

Students attended discussion groups very well except for the last few weeks. Perhaps the discussion topics were not as stimulating at the end as were the other topics of the course. This is doubtful though, since drugs, mental health and consumer health are usually very stimulating topics. Possibly students were becoming weary of the groups. Students may have acquired a pre-conceived notion of other students' ideas by a particular time and any idea exchange after that period of time was redundant.

Discussion groups may, therefore, serve their purpose in a certain period of time and then become less effective with time. Christmas vacation and the end of the semester may have been a reason for a drop in attendance. Perhaps students enjoyed the discussion groups enough to come to them simply because of the group atmosphere. In general, attendance in group discussion was high but reasons for this are unexplainable with such limited data.

It should be noted that although some students felt that they were not getting as much factual information (possibly information needed to pass a test) as they might in the lecture, other types of learning such as higher reasoning and problem solving may have been taking place in the discussion groups and students wanted to be a part of that learning.

A subjective observation of the teacher was that some of the student discussion leaders seemed to develop a sense of security as the course progressed which tended to lead to passiveness. This security was good in that it may have relaxed the group members which probably could have brought better discussion. However, it may be that discussion leaders were not motivated to perform to gain good grades (the grade of A was automatically given to all discussion leaders) so their sense of enthusiasm died in a few cases. Accountability to the teacher may have been lost and the groups may have been hindered because of the leader. Perhaps a better method of selecting the best qualified discussion leader would be in order.

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III. Conclusions

Based upon the results of the analysis and interpretation of the data, and remaining within the limitations of the design of the study, the conclusions were:

1. Student-led discussion groups appeared to be at least as effective in transferring knowledge as the teacher-led discussion groups.

2. Student-led discussion groups seemed to be as effective in developing positive attitudes toward healthful living as the teacher-led discussion groups.

3. A variety of teaching methods should be used in teaching, since many students in both the teacher-led and student-led discussion groups did not seem to respond appropriately in knowledge gain or attitude change.

4. Direct contact with the teacher appeared to be not always mandatory for desired learning to take place, since the student-led groups were without the teacher approximately one-thire of the class time but resulted in similar gains in knowledge and changes in attitudes as the teacher-led groups.

IV. Recommendations

Upon completion of this study, the following recommendations were made:

1. The process of selecting group discussion leaders should be investigated so that without doubt the best student discussion leader can be utilized.

2. Amount of time alloted to students for group discussion should be evaluated so that time in the class may be distributed most efficiently among all methods of instruction.

3. The need of meetings each week to instruct and demonstrate procedures for group discussions to the group leaders should be examined.

4. Other methods of teaching health education should be compared to provide better health education methods of instruction.

5. Methods of rewarding discussion leaders should be considered to promote motivation of the discussion leaders as well as the discussion groups.

6. A comparison of the gain of knowledge and change in attitudes toward healthful living from the Introductory Health course should be investigated with relationship to the age of the students since the older student may know much of the knowledge and have pre-determined attitudes prior to entering the course.

7. A type of general attitude change should be considered in the Introductory Health course since this study was only examining attitudes toward healthful living.

APPENDIX A

Group Leadership

OBJECTIVES OF GROUP:

Individuals with the help and opposition of their classmates, gradually face and make conscious the choices they make in situations crucial to them, and through the experience of articulating, testing, and criticizing their motivations, develop a system of consciously held ideas and values. In the process, the individuals will become sensitive to feelings, to the personal consequences of those choices for other people.

GROUP PROCESS:

1. Warm-up (introduction)
   (a) Relate to personally known incident or problem.
   (b) Purpose--to get response from group.

2. Setting the Stage
   (a) Express problem in vivid detail with specific example.
   (b) Settle group or individuals in their specific role by asking questions.

3. Enactment
   (a) Responding to one another as people in those particular situations would respond.
   (b) Spontaneous reaction is what we are looking for, but with the problem in mind.
   (c) Slips and awkward movements are expected.
   (d) Too much censorship will destroy spontaneity and sense of reality.
   (e) No one in the group will be condemned. Only ideas are presented for attack--not people!

4. Discussion and Evaluation
   (a) Most important!
   (b) Let opinions pour out.
   (c) D.L. guides discussion with open-ended questions such as "What is happening?", "How does Jane feel?", "Could this happen in real life?", "What will happen now?"

5. Conclusions and Generalizing
   (a) Word Concepts into students thoughts.
   (b) Give what you think group has briefly done and possibly test with members.

Hints for Guiding Groups

1. Question must always be as open ended as possible.
   Examples: (1) Do you know someone who would have handled the situation differently?
   (2) Why does Jim behave the way he does?
   (3) In what way could . . .
   (4) How would you remedy this?
   (5) How do you feel about Dick?
   (6) How do you suppose Dick feels about Jim?

2. Listen with all your being to what each child is trying to say. If hesitation--reflect. Example: "You're angry at the group."

3. Discussions follow sessions not precede them.

4. Behavior is caused.

5. Decisions of Discussion Leader:
   (a) Allow an enactment to run only until the behavior that is being proposed is clear. Rescue-Boredom
   (b) Do something over again if there is confusion about it.

6. Don't be discouraged at seeming wild behavior. This shows involvement.

7. Don't force people to participate. Ask them unless you think they can handle it well and will probably turn you down. Then tell them.

8. Initial sessions may develop to the point of being silly. When this happens, stop the individuals and say "You're having fun, but we're not really working on this problem, are we?"

9. Expect the group members to be passive and you must motivate them. Try to have them make a personal commitment. A personal commitment is essential.

10. Don't be discouraged with a "flop." It will probably happen more than once.

11. Tolerate silence--don't try to break silence all the time.

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APPENDIX B

Raw Scores

9:00 Class

Group I Name	Meise Scale Pre	Meise Scale Post	Kilander Pre	Kilander Post
Kitzman (leader)	427	432	52	72
Webber	421	431	53	70
Kriss	394	384	41	67
Palazzolo	391	387	56	73
Goris	437	417	70	82
Klein	415	397	56	67
Elenbass	419	414	73	83
Despres	438	416	76	76
Zurek	405	413	69	70
Group II				
Busch (leader)	423	405	49	46
Lincoln	326	356	60	57
Kuzman	418	378	77	74
Loding	365	389	55	64
Lampman	386	371	80	85
Christopherson	402	400	66	76
DeForest	357	364	49	69
Keller	374	372	55	63
Group III				
Hausenfleck (leader)	372	393	61	75
Sawyer	402	396	55	56
Triece	365	396	47	56
Forrest	385	385	74	80
Rosander	411	387	69	79
Kelly	418	418	74	85
Hassel	399	409	70	86
Borchard	380	413	54	57

Name	Meise Scale Pre	Meise Scale Post	Kilander Pre	Kilander Post
Group IV				
Rabe (leader)	---	---	--	--
Martin	395	378	41	48
Tapio	390	401	53	64
Derks	402	407	50	77
Engel	412	443	61	68
Hutchinson	413	405	64	78
Jackson	394	400	45	59
Glennon	372	383	77	83
Sacksteder	406	413	63	71
1:00 Class				
Group V				
Campbell (leader)	416	400	46	69
Vallance	395	420	65	68
Larsen	400	392	74	73
Dean	406	381	72	75
Adams	419	436	53	63
Doerfer	394	360	70	76
Christenson	441	438	75	83
Cotter	405	403	62	73
Garrod	402	428	62	61
Raymour	377	378	74	70
Group VI				
Hobson (leader)	350	343	43	54
Haxer	392	389	74	65
Saros	411	374	74	72
Mader	454	453	77	72
Molby	412	418	66	76
Wier	424	424	47	48
Forquer	361	364	47	48
McLaughlin	392	411	66	73
Strouf	418	440	65	72

Name	Meise Scale Pre	Meise Scale Post	Kilander Pre	Kilander Post
Group VII				
Fragoules (leader)	404	380	68	77
Knabel	396	406	70	76
Quisenberry	382	394	60	67
Glenn	416	420	68	72
Harris	372	410	66	72
Slatter	382	411	76	81
Hockbarth	408	413	54	62
Fromm	365	384	57	55
Johnston	433	412	52	54
Group VIII				
Rabe (leader)	---	---	--	--
Riverst	366	355	52	53
Marchyok	297	391	74	80
St. Amour	430	446	79	83
Powers	409	391	57	66
Feldman	423	433	76	82
Klosterman	412	414	57	41
Story	405	411	48	67
Zizke	417	412	69	76
Klabunde	415	418	64	74

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